LISTING OF THE CLAIMS

1. (Currently Amended) A method of predicting bone or articular disease in a subject, the method comprising the steps of:

determining one or more micro-structural parameters, one or more macroanatomical parameters, and one or more [[or]] biomechanical parameters of a joint in said subject, wherein determining includes extracting trabecular micro-structure from an image of said subject; and

combining ~~at least two~~ said parameters to predict the risk of bone or articular disease, the ~~at least two~~ said parameters including ~~two or more of~~ a micro-structural parameter, a macro-anatomical parameter, and a biomechanical parameter.

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Original) The method of claim 1, wherein said bone or articular disease is fracture risk.

7. (Original) The method of claim 1, wherein the parameters are obtained from one or more regions of interest in an image obtained from said subject.

8. (Original) The method of claim 7, wherein the image comprises a calibration phantom.

9. (Previously Presented) The method of claim 1, wherein said parameters are selected from the group consisting of: stainless steel equivalent thickness wherein the stainless steel equivalent thickness is determined as the average gray value of the region of interest expressed as thickness of stainless steel with equivalent intensity; trabecular contrast wherein the trabecular contrast is determined as one of the trabecular equivalent thickness and marrow equivalent thickness; fractal dimension; Fourier spectral analysis wherein the Fourier spectral analysis is determined as one of a mean transform coefficient absolute value and a mean spatial first moment; predominant orientation of spatial energy spectrum; at least one of trabecular area and total area; trabecular perimeter; trabecular distance transform; marrow distance transform; trabecular distance transform regional maxima values; marrow distance transform regional maxima values; star volume; trabecular bone pattern factor; connected skeleton count or trees (T); node count (N); segment count (S); node-to-node segment count (NN); node-to-free-end segment count (NF); node-to-node segment length (NNL) node-to-free-end segment length (NFL); free-end-to-free-end segment length (FFL); node-to-node total struts length (NN.TSL); free-end-to-free-ends total struts length (FF.TSL); total struts length (TSL); FF.TSL/TSL; NN.TSL/TSL; loop count (Lo); loop area; mean distance transform values for each connected skeleton; mean distance transform values for each segment (Tb.Th); mean distance transform values for each node-to-node segment (Tb.Th.NN); mean distance transform values for each node-to-free-end segment (Tb.Th.NF); orientation of each segment; angle of each segment; angle between segments; length-thickness ratios (NNL/Tb.Th.NN) and (NFL/Tb.Th.NF); and interconnectivity index (ICI) ICI=(N*NN)/(T*(NF+1)).

10. (Original) The method of claim 1, wherein said combining comprises univariate, bivariate or multivariate statistical analysis.

11. (Original) The method of claim 1, further comprising comparing said parameters to data derived from a reference database of known disease parameters.

12. (Original) The method of claim 1, wherein the bone is in a region selected from the group consisting of leg, knee, hip, spine and arm.

13. (Original) The method of claim 7, wherein the image is selected from the group consisting of an x-ray image, a CT image, an ultrasound image and an MRI.

14. (Original) The method of claim 1, further comprising administering a compound to the subject.

15. (Previously Presented) The method of claim 14, wherein determining and combining are repeated at two or more time points and further wherein one time point is prior to administration of the compound.

16. (Original) A method of determining the effect of a candidate agent on a subject's prognosis for musculoskeletal disease comprising: predicting a first risk of musculoskeletal disease in subject according to the method of claim 1; administering a candidate agent to said subject; predicting a second risk of said musculoskeletal disease in said subject according to the method of claim 1; and comparing said first and second risks, thereby determining the effect of the candidate on the subject's prognosis for said disease.

17. (Original) The method of claim 16, wherein said candidate agent is administered to the subject.

18. (Original) The method of claim 16, wherein said administration comprises ingestion or injection.

19. (Original) The method of claim 16, wherein said candidate agent is selected from the group consisting of molecules, pharmaceuticals, biopharmaceuticals, agropharmaceuticals and combinations thereof.

20. (Previously Presented) The method of claim 1 wherein said parameters are selected from the group consisting of total cartilage volume; focal cartilage volume; a cartilage thickness distribution or thickness map; mean cartilage thickness over substantially total surface; mean cartilage thickness in focal area; median cartilage thickness; maximum cartilage thickness; minimum cartilage thickness; 3D cartilage surface information; cartilage curvature analysis; volume of cartilage defect/diseased cartilage; depth of cartilage defect/diseased cartilage; area of cartilage defect/diseased cartilage; at least one of 2D and 3D location of cartilage defect/diseased cartilage in the articular surface; at least one of 2D and 3D location of cartilage defect/diseased cartilage in relationship to weight- bearing area; a ratio of at least two of diameter of cartilage defect, diameter of diseased cartilage, and thickness of surrounding normal cartilage; a ratio of at least two of depth of cartilage defect, depth of diseased cartilage and thickness of surrounding normal cartilage; a ratio of at least two of volume of cartilage defect, volume of diseased cartilage and thickness of surrounding normal cartilage; a ratio of at least two of surface area of cartilage defect, surface area of diseased cartilage and total joint surface area; and a ratio of at least two of volume of cartilage defect, volume of diseased cartilage and total cartilage volume.

21. (Previously Presented) The method of claim 1 wherein said parameters are selected from the group consisting of: a presence or absence of bone marrow edema; a volume of bone marrow edema; a volume of bone marrow edema normalized by at least one of width, area, size, and volume; a presence or absence of osteophytes; a presence or absence of subchondral cysts; a presence or absence of subchondral sclerosis; a volume of osteophytes; a volume of subchondral cysts; a volume of subchondral sclerosis; an area of bone marrow edema; an area of osteophytes; an area of subchondral cysts; an area of subchondral sclerosis; a depth of bone marrow edema; a depth of osteophytes; a depth of subchondral cysts; a depth of subchondral sclerosis; at least one of a volume, area, and depth of at least one of an osteophytes, subchondral cysts, subchondral sclerosis wherein the at least one of volume, area, and depth is normalized by at least one of width, area,

size, volume a bone proximal to at least one of the osteophyte, subchondral cyst, or subchondral sclerosis; a presence or absence of meniscal tear; a presence or absence of cruciate ligament tear; a presence or absence of collateral ligament tear; a volume of menisci; a ratio of volume of normal to at least one of torn, damaged and degenerated meniscal tissue; a ratio of surface area of normal to at least one of torn, damaged and degenerated meniscal tissue; a ratio of surface area of normal to at least one of torn, damaged and degenerated meniscal tissue to total joint or cartilage surface area; a ratio of surface area of at least one of torn, damaged and degenerated meniscal tissue to a total surface area of at least one of joint and cartilage; a size ratio of opposing articular surfaces; a meniscal subluxation/dislocation in millimeters; an index combining different articular parameters; a 3D surface contour information of subchondral bone; an actual or predicted knee flexion angle during gait cycle; a predicted knee rotation during gait cycle; a predicted knee displacement during gait cycle; a predicted load bearing line on cartilage surface during gait cycle and measurement of distance between load bearing line and at least one of cartilage defect and diseased cartilage; a predicted load bearing area on cartilage surface during gait cycle and measurement of distance between load bearing area and at least one of cartilage defect and diseased cartilage; a predicted load bearing line on cartilage surface during standing or different degrees of knee flexion and extension and measurement of distance between load bearing line and at least one of cartilage defect and diseased cartilage; a predicted load bearing area on cartilage surface during standing or different degrees of knee flexion and extension and measurement of distance between load bearing area and at least one of cartilage defect and diseased cartilage; a ratio of load bearing area to area of at least one of cartilage defect and diseased cartilage; a percentage of load bearing area affected by cartilage disease; a location of cartilage defect within load bearing area; a load applied to cartilage defect, area of diseased cartilage; and a load applied to cartilage adjacent to at least one of cartilage defect and area of diseased cartilage.